

20/4/17 FN

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**Question Paper Code : 72119**

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Seventh/Eighth Semester

Mechanical Engineering

ME 6010 — ROBOTICS

(Common to Automobile Engineering/ Manufacturing Engineering/ Mechanical and Automation Engineering/ Production Engineering)

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by work Envelope?
2. What is meant by Pay Load capacity of Robot?
3. State the limitations of the Stepper Motor as a drive systems for a Robot.
4. Give the examples of tools used as Robot End Effector.
5. What are the applications of Position Sensors?
6. What is meant by Feature Extraction?
7. State the reasons for homogenous transformation.
8. What are the methods of Robot programming?
9. What is meant by RGV? Where it is used?
10. List out the various methods of Economic Analysis of Robots?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the various configurations of Robot with neat diagram. (16)

Or

- (b) Discuss in detail about the functions and need of Industrial Robots. (16)

12. (a) Discuss the salient features, capabilities, applications, merits and limitations of Stepper and Servo Motors. (16)

Or

- (b) Discuss the following in detail:

(i) Vacuum Grippers.

(ii) Magnetic Grippers. (8+8=16)

13. (a) What are the basic characters that a sensor should possess? (16)

Or

- (b) Discuss how the image segmentation helps to improve the quality of an image in a machine vision system. (16)

14. (a) Describe the Kinematics and dynamics of a Robot. (16)

Or

- (b) Discuss about the advantages and disadvantages of lead through programming in detail. (16)

15. (a) Explain the Obstacle detection and avoidance in AGVs. (16)

Or

- (b) Explain the factors to be considered for Industrial application of Robots. (16)